SUNITA PAYRA VERMA
California Institute of Technology/JPL
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EDUCATION

Doctor of Philosophy, Atmospheric Sciences **2001- 2005**
Centre for Atmospheric Sciences
Indian Institute of Technology Delhi (IIT Delhi), India

Master of Technology, Environmental Sciences **1997-1999**
Department of Environmental Science and Engineering
G.J. University, Hisar, India

RESEARCH EXPERIENCE

Jet Populursion Laboratory, CALTECH and NASA **Nov., 2006—present**
Post-doctorate Fellow

- Long range transport of Black Carbon

Centre for Global Environment Research, TERI Delhi, India
April, 2006–Oct, 2006
Associate Fellow

- Climate modeling on Hadley center Regional Climate Model (PRECIS).
- Development of Climate Change Scenarios

Centre for Atmospheric Sciences, IIT Delhi, India **Dec, 2000 - June, 2006**
Senior Research Fellow

- Aerosols and Indian Monsoons
- Simulations of sulfate aerosols and their radiative effects

Centre for Energy Studies, IIT Delhi, India **1999--2000**
Research Associate

- In project entitled "Scale up to obtain super clean coal - Organo-refining and identification of end users"

Centre for Atmospheric Sciences, IIT Delhi, India **1998-1999**
M. Tech. Project

- Determined the downwind concentration levels upto 100 kms for radioactive elements using Gaussian plume model taking into account of the effects like radioactive decay, building effects and coastal conditions etc.

Department of Environmental Sciences, G J. University, Hisar, India **1997-1998**
M.Sc. Project

- Trend analysis and forecasting of pollution parameters: SOx, NOx, SPM for Delhi region using statgraphics software.

TEACHING EXPERIENCE

Guest lecture on the Biogeochemical Cycles for M.Sc.-II, Environmental studies at TERI School of Advanced Studies, Delhi, India
Lecture on the science of climate change for M.Sc.-II, Environmental studies at TERI School of Advanced Studies, Delhi, India
Teaching Assistant **2000-2002**
Environmental Monitoring and Analysis Lab
Conducted classroom sessions with graduate students to facilitate their understanding of course material; graded their assignments. Developed problem sets.

Mentored junior graduate to conduct research.

ENVIRONMENTAL AND CLIMATE MODELS/TOOLS

Experience in developing and running regional and global scale models to understand air pollution, regional and global climate effects.
Atmospheric dispersion and EPA models.

COMPUTER SKILLS

Platform used	: Digital, Compaq XP-1000, Sun Solaries
Operating Systems	: Ms-Dos, WINDOWS Series, UNIX, LINUX
Languages	: F77, F99, C, C++, Unix shell programs
Graphical packages	: FERRET, GRADS, Xmgrace
Editorial Softwares	: LaTeX, Emacs, MS-word, Powerpoint

AWARDS AND HONORS

- Best Paper Presentation Award at the International conference on Aerosols, clouds and Indian Monsoons, IATSA -2004. http://www.iitd.ac.in/about/stuawards.html
- Indo-French Centre for the Promotion of Advanced Research (IFCPAR), Doctoral fellowship for 2000-2004.
- Graduate Scholarship, Haryana Government, India, 1992-1995.
- 10+2 Scholarship Haryana Government, India, 1990-1992.

PROJECTS/PANELS

Scientific staff of the project Aerosols and Indian Monsoons financed by Centre Franco Indien pour la Promotion de la Recherche Avancess, 2000-2004.

RESEARCH PUBLICATIONS

S. Verma, Boucher, O., Reddy, M. S., Upadhyaya, H. C., Levan, P., Binkowski, F., and Sharma, O. P., Modeling and analysis of sulfate aerosol processes in an interactive chemistry GCM, article in proof, 112, XXXXXX, doi:10.1029/2005JD006077, , J. Geophys. Research, 2007

S. Verma, O. Boucher, H.C. Upadhyaya and O. P. Sharma, Sulfate aerosols forcing: An estimate using a three-dimensional interactive chemistry scheme *Atmospheric Environment, Volume 40, Issue 40, 7953-7962, 2006.*

S. Verma, O. Boucher, M. S. Reddy, S.K. Deb, H.C. Upadhyaya, P. Levan, F. Binkowski and O.P. Sharma, Tropospheric distribution of sulphate aerosol number and mass concentrations for INDOEX-IFP and its transport over Indian Ocean, Atmos. Chem. and Phy. Discuss., 5, 395-436, 2005.

S. Verma, S.K. Deb, O. Boucher, H.C. Upadhyaya, O.P. Sharma, M. Shekar Reddy, P. Levan and F. Binkowski, A GCM study on sulphate aerosols during the winter monsoon season for 1998 and 1999, Bulletin of the Indian Aerosol Science and Technology Association (IASTA-2004), 16(1), 43-45, 2004.

S.K. Deb, ***S. Verma,*** H.C. Upadhyaya, J.Y. Grandpeix and O.P. Sharma, Parameterization in tropics, some aspects of environmental fluid mechanics, Environmental Fluid Mechanics (ICEFM-2005), Eds. S. N. Bora, Ellied Publishers. Pvt. Ltd., 159-165, 2005.

THESIS/ REPORTS

1. **Verma, S.**, Global Model Simulations of Sulfate Aerosols, Indian Institute of Technology Delhi, Ph.D. Thesis, pp. 168, 2006, Delhi, INDIA.
2. **Verma S.**, Downwind concentration levels upto 100 kms for radioactive elements using Gaussian plume model taking into account of the effects like radioactive decay, M.Tech. Thesis, pp. 112, 1999, INDIA.

PRESENTATIONS:

Sunita Verma, O. Boucher, H.C. Upadhyaya, O.P. Sharma, M. S. Reddy, P. Levan and F. Binkowski, "Simulation of Sulphate Aerosol Distribution for the INDOEX period with Interactive Chemistry in a Global Model" INDOCLIM- International workshop on Role of Indian Ocean on Climate Variability, February 23-27, 2004, **INDOCLIM, IITM, Pune, India**.

Sunita Verma, S.K. Deb, O. Boucher, H.C. Upadhyaya and O.P. Sharma, "Analysis of sulphur cycle in the LMD-ZT global circulation model", 8th International Global

Atmospheric Chemistry Conference, 4-9 September, 2004, **IGAC**, **Christchurch, New Zealand**. (Lead Talk)

Sunita Verma, H.C. Upadhyaya, O.P. Sharma and O. Boucher, "GCM estimate on sulfate aerosol radiative and optical properties", 5th International Scientific Conference on the Global Energy and Water Cycle, June 20-24, 2005, **GEWEX, Orange County, California, USA**.

Sunita Verma, H.C. Upadhyaya and O.P. Sharma, 5th International Scientific Conference on the Global Energy and Water Cycle, "GCM evaluation on the transport of sulfate aerosols over the Indian Ocean**",** June 20-24, 2005, **GEWEX, Orange County, California,USA** (Lead Presentation). http://www.gewex.org/Aug2005.pdf (page10)

Sunita Verma, O., Boucher, H.C. Upadhyaya and O.P. Sharma, Gas-Phase and Aqueous-Phase chemical reactions: incorporation and evaluation in an online global chemistry model, SRef-ID: 1607-7962/gra/EGU05-A-00282, European Geosciences Union, Geophysical Research Abstracts, Vol. 7, 00282, 2005.
www.cosis.net/abstracts/EGU05/00282/EGU05-J-00282.pdf

*Sunita Verma, O. P. Sharma and H. C. Upadhyaya***,** An updated approach to represent aerosols in global chemistry model, Asian Aerosol Conference, AAC 2005, December 13-16, 2005, **Mumbai,** India.

Sunita Verma, O. P. Sharma, H. C. Upadhyaya and O. Boucher, On the Representation of Tropospheric Chemistry for Gas-Particle Dynamics and Cloud Interactions in an Interactive GCM**, 1st iLEAPS Science Conference Boulder, Colorado, USA,** 21-26 January 2006.

Sunita Verma, H. C. Upadhyaya, O. Boucher and O. P. Sharma, "Pollution over the Indian Ocean: A study in context to sulfate aerosols", International Conference on Mesoscale Processes Atmosphere, Ocean and Environmental Systems (**IMPA2006), Indian Institute of Technology Delhi,** February 14-17, 2006.

Sunita Verma, An invited talk on Atmospheric Global Model Simulations of Sulfate Aerosols and their Radiative Effects, **JPL, NASA, California Institute of Technology, Californaia , USA,** 16th February, 2006.

CONFERENCES/WORKSHOP ATTENDED:

Indo-US workshop on **Weather & Climate Modeling**, held during February: 7-9-2002, sponsored by Indo-US Science & Technology Forum in **New Delhi, India**

Summer Colloquium on **Data Assimilation for Atmospheric & Climate System Prediction**, held during 7-18th July 2003, at The National Center for Atmospheric Research, in **Boulder Colorado, U.S.A**.

Summer School on **mountain meteorology**, held during 25-30th July 2004 at University of Trento**, Trento, Italy**.

Brain storming seminar on **High performance computing for weather and climate modeling,** 2-4 March 2005, sponsored by Department of Science and Technology, Government of India at Centre for Atmospheric Sciences, **IIT, Delhi, India**.

Intercontinental Transport Modeling Intercomparison Organizational Workshop, 30-31 January 2006, **Washington, USA**.

Workshop on Climate Change and sustainable development, **7-8 April 2006,** Centre for Global Environmental Research, **TERI, Delhi, India.**

Asia-Pacific Consultations on Climate Regime Beyond 2012 – South Asia, **9-10 August, Hotel Ashok, TERI Delhi, India**

South-South collaborative study tour to "**Explore technology options for Climate Change Mitigation and Adaptation in Maldives", 23-30 August, TERI, Delhi, India**

Areas of interest

1. Modeling of atmospheric transport of pollutants including emissions, transformation, and deposition in the General Circulation Model.
2. Development of aerosol optical properties to integrate into the radiation transfer code.
3. Long-term simulations of aerosol transport, source contribution to the aerosol loads, radiative perturbation over different regions of the World.
4. Understanding of natural aerosol emissions, and their fate in the fast and future climates.
5. The atmospheric budgets and forcings of carbonaceous aerosols in the present and future climate for different SRES emission scenarios.
6. Estimation of regional contributions to global black carbon loads and climate impacts.

PROFESSIONAL MEMBERSHIPS

American Geophysical Union
Indian Aerosol Science and Technology Association